YUCHEN QUAN

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Google Scholar ◇ Github ◇ LinkedIn

EDUCATION

China University of Petroleum, Beijing *June 2026 (expected)*

Project **211** university in China
M.S. in Information and Communication Engineering
GPA: 3.48/5.0
Main courses: Pattern Recognition, Matrix Theory, Numerical Analysis;

Zhengzhou University *June 2023*

Project **211** University in China
B.E. in Telecommunication Engineering
GPA: 2.83/4.0
Main courses: Calculus A(I), Calculus A(II), Linear Algebra A, Probability Theory and Statistics A, Engineering Programming, Engineering Programming2, C Programming, Engineering Maths, Principles of Communications, Digital Signal Processing;
Self-learning courses: CS61A: Structure and Interpretation of Computer Programs, Stanford CS106B: Programming Abstractions in C++;

RESEARCH INTERESTS

My research interests lie at the intersection of Generative Models and Computer Vision, particularly in the field of medical images. I utilize insights from a stochastic differential equation view to enhance the diffusion training, and a Bayesian inference view to improve the inference of the diffusion model.

PUBLICATIONS

[1] **Yuchen Quan**, Z. Liu, and R. Guo, "Modeling and numerical simulation optimization of gain spectrum of thulium-doped broadband fiber amplifier based on cat swam algorithm," in *The 5th International Conference on Computing and Data Science(CONF-CDS 2023)*, 2023.
[2] **Yuchen Quan** and N. Wang, "Design of mobile station positioning algorithm based on lte measurement report," *Undergraduate graduation thesis*, 2023.
[3] **Yuchen Quan** and Y. Xue, "Solving low-dose computer tomography inverse problem by learning the first-order score of the sparse sinogram samples' distribution," *Under The Pacific Rim International Conference on Artificial Intelligence(PRICAI 2025) Review*, 2025.
[4] **Yuchen Quan** and Y. Xue, "Pc-pocs sampler to reconstruct a low-dose computer tomography image consistent with both the prior and the measurements," *Under The IEEE International Conference on Bioinformatics and Biomedicine(BIBM 2025) Review*, 2025.

RESEARCH EXPERIENCE

Optimization of gain spectrum of thulium-doped broadband fiber amplifier [1] June 2022 - June 2023
Supervisors: Prof. Ning Wang Zhengzhou University

- Proposed an algorithm to optimize the thulium-doped fiber amplifier's gain from 1450nm to 1520nm.
- Found that the maximum value of the gain curve of the fiber amplifier can be obtained based on the efficient function convergence rate and good optimization results of the cat colony optimization, which can be used in the design and application of a thulium-doped fiber amplifier.
- Responsibilities: Design the experiment; create the workflow; Collect and preprocess the fiber data; Coding in Matlab; Visualize results; Write and publish peer-reviewed papers

Design of mobile station positioning algorithm based on LTE measurement report [2] June 2022 - June 2023
Supervisors: Prof. Ning Wang Zhengzhou University

- Proposed an algorithm to improve the precision of the positioning algorithm.
- Responsibilities: Design and run the experiment; Construct the workflow; Collect the communication data of 2008, Lanzhou in China; Code in Python; Visualize results; Write papers

PC-sampler algorithm development(GMC) [3] Sep 2024 - Jan 2025
Supervisors: Prof. Yaru Xue China University of Petroleum, Beijing

- Proposed an inference algorithm, called GMC(Gradient Manifold Constraint), to sample from the prior distribution of the score-based diffusion model, improving the SSIM of the reconstruction image 14% to the method proposed in the original paper(Song).
- Responsibilities: Design the whole project and the structure of the code; Collect the DICOM computer tomography data; Construct the workflow; Code with Pytorch; Visualize results; Write and publish peer-reviewed papers

PC-sampler algorithm development(POCS) [4] Jan 2025 - Aug 2025
Supervisors: Prof. Yaru Xue China University of Petroleum, Beijing

- Proposed an inference algorithm, called POCS(Projection On Convex Set), to sample from the prior distribution of the score-based diffusion model, which could operate with an acceptable information loss (SSIM$\approx$ 0.83) when the sparsity is as low as 30 (6-views).
- Responsibilities: Design the whole project and the structure of the code; Collect the DICOM computer tomography data; Construct the workflow; Code with Pytorch; Visualize results; Write and publish peer-reviewed papers

INDUSTRY EXPERIENCE

Software Engineering Center Chinese Academy of Sciences July 2024 - Aug 2024
Q&A System On Medical Knowledge Graph Research Intern

- Use Neo4j to construct a graph database.
- Create answer nodes and build connections between nodes through correlations.
- Build a chatbot to query the corresponding answers in the database based on user input and connect them with the corresponding answer statements to form answer feedback.

Sinopec Engineering Co., LTD., Guangzhou July 2023 - Aug 2023
Video Surveillance System Intern

- Worked on the Video surveillance system
- Worked on video surveillance storage equipment video storage expansion cabinet project
- Worked on the license plate and face recognition system

SIDE PROJECT

All the homework and Project of UCB CS61A: Structure and Interpretation of Computer Programs

- Improve the skills of Python;

All the homework and Project of Stanford CS106B: Programming Abstractions in C++

- Improve the skills of C++;

SERVICES

Program Committee Member *PRICAI 2025*

ACHIEVEMENTS

Second Prize Scholarship of Zhengzhou University *2021*
Third Prize Scholarship of Zhengzhou University *2022*
Merit Intern of Potevio Information Technology Co., Ltd. *2022*
Third Prize Scholarship of China University of Petroleum, Beijing *2024*
Third Prize Scholarship of China University of Petroleum, Beijing *2025*

SKILLS/HOBBIES

Programming Languages	Python, C++, MATLAB, HTML
Machine Learning Tools	Pytorch, Tensorflow, Jax
English	A score of **501** in Chinese College English Test Band 6